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Forest Service

Sanpoil Vegetation Management Project: Additional Terrestrial Wildlife Analysis Report

Three Rivers Ranger District

Colville National Forest

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Introduction

This report addresses terrestrial wildlife species not listed as Threatened and Endangered or as Region 6 Sensitive Species. Species addressed include surrogate, focal, management indicator, and management interest species along with landbirds. For project area description, proposed treatments, wildlife issues and design criteria refer to the Biological Evaluation for this proposed project.

Relevant Laws, Regulations, and Policy

Land Management Plan

The Colville National Forest Land Management Plan (2019) provides standards and guidelines for Wildlife Habitat (pg. 57-69). This report incorporates the LMP by reference and is tiered to the Land Management Plan's Final Environmental Impact Statement (USDA Forest Service 2019).

Desired Conditions

As described in the Colville National Forest Land Management Plan (2019) the following are desired conditions for species/habitats which are discussed in this report:

- *FW-DC-WL-03. Habitat Conditions for all Surrogate Species* – Habitat conditions (amount, distribution, and connectivity of habitat) are consistent with the historical range of variability (per FW-DC-VEG-03 and 04) and contribute to the viability of surrogate species and associated species.
- *FW-DC-WL-10. Risk Factors for all Surrogate Species* – Risk factors (such as roads, uncharacteristic wildfire, unregulated livestock use, introduced species, invasive species, and disturbance during critical time periods) for all surrogate species are reduced to contribute to the viability of surrogate species and associated species.
- *FW-DC-WL-13. Deer and Elk Habitat* – Summer and Winter Range Cover and Forage: Cover and forage for deer and elk summer and winter range are within historical range of variability for vegetation (per FW-DC-VEG-03 and table 5 in USDA, 2019).
- *FW-DC-WL-14. Deer and Elk Habitat* – Human Activities Winter ranges for deer and elk provide a high level of habitat effectiveness by having less than 30 percent of the winter range within a zone of influence of an open road or motorized travel route. Summer ranges provide a moderate level of habitat effectiveness by having less than 50 percent of the summer range within a zone of influence of an open road or motorized trail.
- *FW-DC-VEG-04 Snags and Coarse Woody Debris* – Snags and down wood occur in sizes, amounts, and distributions to provide important wildlife habitat and contribute to ecosystem processes and services. This desired condition for snag and down wood levels applies forest wide within forested habitat types with the exception of the Administrative and Recreation Sites Management Areas. The desired conditions for snags and down wood levels is evaluated on National Forest system lands at the watershed scale (see Table 7 and table 8 in USDA, 2019).

Other Guidance or Recommendations

In 2003, the Forest Service released “DecAID”, an internet-based tool developed to help land managers evaluate the effects of forest management on wildlife species that use dead wood habitats. DecAID was last updated in 2017 (Mellen-McLean et al. 2017). DecAID provides forest inventory data for dead wood habitats on the national forests of Oregon and Washington. It is a tool that synthesizes published literature, research data, wildlife databases, and expert judgment and experience.

The United States Department of the Interior (USDI) Fish and Wildlife Service (FWS) is the lead federal agency for managing and conserving migratory birds in the United States. However, under Executive Order (EO) 13186, all other federal agencies are charged with the conservation and protection of migratory birds. In brief, this order requires agencies to:

- Integrate bird conservation principles, measures, and practices into agency activities. Avoid or minimize adverse impacts on migratory bird resources when conducting agency actions.
- Ensure that environmental analyses evaluate the effects of agency actions on migratory birds, especially species of concern.
- Restore and enhance the habitat of migratory birds, as practicable.

In January 2001, the Forest Service (FS) and the FWS developed a Memorandum of Understanding (MOU) regarding the management of landbirds. In general, the MOU directs the FS to:

- Consult the current FWS Birds of Conservation Concern, state lists, and comprehensive planning efforts for migratory birds, when developing the list of species to be considered in the planning process.
- Incorporate migratory bird habitat and population management objectives and recommendations into agency planning processes.
- Strive to protect, restore, enhance, and manage habitats of migratory birds, and prevent the further loss or degradation of habitats on National Forest System lands.

The “Birds of Conservation Concern Report” (USDI 2008) identifies species, subspecies, and populations of migratory and non-migratory birds in need of conservation actions. The goal is to preclude the need for additional ESA bird listings by implementing proactive management and conservation actions. Long-term monitoring of migratory birds in the western US indicates that the main area of concern relating to forest management is habitat fragmentation. The areas of concern related to forest management are habitat alteration or loss due to exotic species invasions and habitat alteration due to fire suppression.

Methodology

Refer to Sanpoil BE for information on pre-field and field review, incomplete and unavailable information, and the use of best available science.

All data are imperfect and thus have limitations. Most data included in models, especially models concerning the Historic Range of Variability (HRV), is a best estimate only. The Biological Evaluation discusses wildlife population estimates and how difficult it is to obtain this data. Gaines 2017 and DecAID are considered the current management recommendation for maintaining species viability. Even with imperfect data, DecAID (Mellen-McLean et al., 2017) is still a compilation of the best available data relating to snags and down wood. The limitations associated with the underlying data need to be kept in mind by the user when using DecAID for project analyses. Used properly, DecAID can help guide management of dead wood to meet management goals. There is stronger evidence to support the meta-analysis approach of DecAID (combining data from across multiple studies and the comparison to forest inventory data) rather than attempting to apply data from individual studies.

Surrogate Species

The selected surrogate species represent specific habitats and risk factors across the planning area. The viability of surrogate species is enhanced by providing favorable habitat conditions consistent with the historical range of variability (appropriate mix of cover types and structure stages) and reducing risk factors that may affect viability of the species. (Desired Conditions: *FW-DC-WL-03* & *FW-DC-WL-10*, USFS 2019)

Historic and current viability of terrestrial vertebrates were calculated to assess the changes in habitat conditions overtime. The determinations are based on the departure from historic habitat conditions. Viability Outcome Determination Descriptions (Gaines et. al. 2017):

- A- Suitable environments are broadly distributed across the historical range of the species. Habitat abundance is high relative to historical conditions. The combination of distribution and abundance of environmental conditions provides opportunity for continuous or nearly continuous intraspecific interactions for the species.
- B- Suitable environments are broadly distributed across the historical range of the species. Suitable environments are of moderate to high abundance relative to historical conditions, but there may be gaps where suitable environments are absent or present in low abundance. However, any disjunct areas of suitable environments are typically large enough and close enough to permit dispersal among subpopulations and to allow the species to potentially interact as a metapopulation. Species with this outcome are likely well distributed throughout most of the assessment area.
- C- Suitable environments are moderately distributed across the historical range of the species. Suitable environments exist at moderate abundance relative to historical conditions. Gaps where suitable environments are either absent or present in low abundance are large enough that some subpopulations may be isolated, limiting opportunity for intraspecific interactions especially for species with limited dispersal ability. For species for which this is not the historical condition, reduction in the species' range in the assessment area may have resulted. Species with this outcome are likely well distributed in only a portion of the assessment area.
- D- Suitable environments are low to moderately distributed across the historical range of the species. Suitable environments exist at low abundance relative to their historical conditions. While some of the subpopulations associated with these environments may be self-sustaining, there is limited opportunity for population interactions among many of the suitable environmental patches for species with limited dispersal ability. For species for which this is not the historical condition, reduction in the species' range in the assessment area may have resulted. These species may not be well distributed in the assessment area.
- E- Suitable environments are highly isolated and exist at very low abundance relative to their historical conditions. Suitable environments are not well distributed across the historical range of the species. For species with limited dispersal ability there may be little or no possibility of population interactions among suitable environment patches, resulting in potential for extirpations within many of the patches, and little likelihood of recolonization of such patches. There has likely been a reduction in the species' range from historical conditions, except for some rare, local endemics that may have persisted in this condition since the historical period. Species with this outcome are not well distributed in the assessment area.

Table 1: Surrogate species listed for the Colville National Forest (USDA 2019). This table does not include species which are covered as a federally listed or sensitive species. (Shaded species will be addressed further in this report)

Species	Status in Project Area	Grouping, Habitat Description and Viability (Gaines et. al. 2017)	Management Framework
American marten (<i>Martes americana</i>)	Suspected	Medium/large trees and Cold-moist forest group. Prefer higher elevation, mature, cold-moist forest (subalpine fir) with old growth components such as large snags and logs and closed-canopy. Additionally they select for this habitat near riparian areas. Historic viability: A Current viability: B-C.	USDA 2019 Mellen-McLean et. al. 2017
Bighorn Sheep (<i>Ovis canadensis</i>)	Habitat not present	Grassland/shrubland group. Prefer Douglas-fir, ponderosa pine, and shrub-steppe cover types with canopy closure <60%. This habitat is near escape terrain with slopes between 31 and 85 degrees and is >4 acres. Historic viability: A Current viability C	USDA 2019, Gaines et. al. 2017
Black-backed woodpecker	Habitat not present	Postfire habitat group with high density of trees and snags (unsalvaged). They are almost exclusively associated with recently burned areas (<5 years). Secondary habitat is	USDA 2019 McLean et. al.

Species	Status in Project Area	Grouping, Habitat Description and Viability (Gaines et. al. 2017)	Management Framework
<i>(Picoides arcticus)</i>		described as forests with >10" d.b.h. and >50% canopy closure. Also areas with a high degree of insect outbreak over the past 10 years. Historic Viability: A Current viability: primarily C.	2017, Altman and Bresson 2017
Cassin's finch (<i>Haemorhous cassinii</i>)	Suspected	Primarily the Medium/large tree in all forest communities group . Breed in open, mature coniferous forests of lodgepole and ponderosa pine, aspen, subalpine fir, grand-fir and juniper woodlands. Positively influenced by thinning and burning restoration treatments within dry forests that retain large trees but reduce canopy cover. More abundant in salvage logged stands where dead and down lodgepole pine was removed. Historic viability: A Current viability: D	USDA 2019
Columbia spotted frog (<i>Rana luteiventris</i>)	Suspected	Ponds/small lake/backwater group . Breeding habitat is small silt or muck bottom ponds with emergent vegetation. Wintering habitat is large (5ac.), deep (>10ft) ponds and lakes. Historic viability: A Current viability: C	USDA 2019
Eared grebe (<i>Podiceps nigricollis</i>)	Habitat not present	Wetland/marsh/open water group . Large very open (70% open water) wetlands, ponds, and lakes >75 acres, < 9.8ft deep, and below 5,900 ft. elevation are preferred. Historic viability: C-D Current Viability: E	USDA 2019
Fox sparrow (<i>Passerella iliaca</i>)	Suspected	Early successional and open forest group . Strongly associated with riparian shrubs (ex. Willow, alder) and the shrub stage (3 to 15 years of growth) of succession following fire and clearcut logging in mature forests. Single and multistory forest stands in mesic forest, cold-dry, cold-moist, and parkland vegetation with <30% canopy cover. Historically viability: A Current viability: E	USDA 2019
Fringed myotis (<i>Myotis thysanodes</i>)	Suspected	Open forest . Common in dry woodlands (ponderosa pine) but found in a wide variety of habitats. Roosts in crevices in buildings, mines, rocks, cliff faces, and bridges. Roosting in large decadent trees and large snags is common. No viability assessment due to lack of knowledge to adequately map habitat and develop a model at this scale.	USDA 2019 Hayes and Wiles 2013
Golden eagle (<i>Aquila chrysaetos</i>)	Habitat not present	Woodland/grass/shrub group . Habitat requirements include sources of food, nesting sites, and limited human intrusion. They typically nest in cliffs (>50ft high at < 3,500 elevation). Typically forage in open grassland, sagebrush, and other native shrub communities. They avoid foraging in agricultural land and burned areas. Historic viability: A Current viability: B	USDA 2019 Altman and Bresson 2017
Lark sparrow (<i>Chondestes grammacus</i>)	Habitat not present	Woodland/grass/shrub group . Found in dry open grasslands, shrub-steppe, and mixed-grass and shortgrass uplands with a shrub component and sparse litter. Prefer structurally open herbaceous ground cover containing scatter trees or shrubs with <24% canopy cover. Historic viability: A Current viability: C-D	USDA 2019
MacGillivray's warbler (<i>Oporornis tolmiei</i>)	Suspected	Shrubby deciduous habitats within the deciduous riparian group . Prefers canyons and draws, dense willows along streams, second-growth woodland habitat that can be created by fire or logging, including dead or fallen trees, brushy areas near low moist ground, and brushy dry hillsides not far from water. Requires dense undergrowth and moderate cover for breeding. Strong association with riparian habitats in dry forest types. Historic viability: A Current viability: C	USDA 2019 Altman and Bresson 2017
Marsh wren (<i>Cistothorus palustris</i>)	Habitat not present	Marsh group of wetland family . Cattail marshes with interspersed open water, depths >3.3 ft., and with dense vegetation are preferred nesting sites. Large patches of marshes are preferred for nesting >40ac. Historical viability: A Current viability: C	USDA 2019
Northern bog lemming (<i>Synaptomys borealis</i>)	Habitat not present	Boreal Forest . This species requires a very restricted habitat (high elevation, boreal bogs or fens) that could be sensitive to forest management. Found in Pend Oreille County, East Zone of the CNF, this species is only known to occur in Bunchgrass Meadows.	USDA 2019
Northern Harrier (<i>Circus hudsonius</i>)	Habitat not present	Grassland group . Open grassland habitats with tall dense vegetation and abundant residual vegetation. Associated with wet or dry grasslands fresh to alkali wetlands, lightly grazed pastures, croplands, fallow fields, old fields, and shrubby areas. They nest on the ground or over water on platforms of vegetation in stands of cattail or other emergent vegetation. Historical viability: A Current viability: C	USDA 2019
Pallid bat (<i>Antrozous pallidus</i>)	Suspected	Woodland/grass/shrub . Roosts include crevices in rocky outcrops and cliffs, caves, mines, tree boles, cavities in oaks, exfoliating ponderosa pine bark, deciduous trees in riparian areas, and various human structures. Forage over open shrub-steppe grasslands, oak savannah grasslands, open ponderosa pine forests, talus slopes, gravel roads, etc. No viability assessment due to lack of knowledge to adequately map habitat and develop a model at this scale.	USDA 2019 Hayes and Wiles 2013

Species	Status in Project Area	Grouping, Habitat Description and Viability (Gaines et. al. 2017)	Management Framework
Peregrine falcon (<i>falco peregrinus anatum</i>)	Habitat not present	Habitat generalist/cliff group. Nesting occurs on prominent cliffs below 3,300ft in elevation. Foraging habitat are water bodies nearby nesting sites. They have been documented nesting on Washington Rock in northern Pend Oreille County. Historic viability: A Current viability: B	USDA 2019
Pileated woodpecker (<i>Dryocopus pileatus</i>)	Documented	Medium-large trees/cool/moist forest group. Mature and old-growth forest in Douglas fir or cedar/hemlock cover types, and high densities of large snags and logs. May also use younger forests with scattered large dead trees. Historic viability: A Current viability: C	USDA 2019 McLean et. al. 2017
Sage thrasher (<i>Oreoscoptes montanus</i>)	Habitat not present	Habitat is sagebrush/shrub-steppe habitat; which does not occur on the CNF. With the absence of the proper habitat, range maps also showing this species does not occur on the CNF, and no sighting information this species does not need to be examined further.	N/A
Tiger salamander (<i>Ambystoma tigrinum</i>)	Suspected	Grass/shrub group. Habitat is described as areas within dry forest which have wetlands and ponds at elevations from 670 to 3,000 ft. Important features of breeding sites include persistence of water mid-March to mid-August, shallow (<3ft) water depths in a portion of water bodies, and abundant vegetation along the shoreline. Outside the breeding period they use grassland, shrub-steppe, and open forest habitats. Historic viability: A Current viability: C	USDA 2019
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	Documented	Chambers/caves group. This bat hibernates and roost in caves or mine adits that are generally close to freezing. Nursery colonies are typically located in sites above 50 degrees F.; often in old abandoned buildings. (Hayes and Wiles, 2013) Foraging habitat includes edge habitat along streams adjacent to and within a variety of wooded habitats. No viability assessment due to lack of knowledge to adequately map habitat and develop a model at this scale.	USDA 2019 Hayes and Wiles 2013,
Western bluebird (<i>Sialia Mexicana</i>)	Suspected	Open forest/all forest group. Widely distributed in open low-elevation coniferous forests (specifically Douglas-fir forests), wooded riparian areas, grasslands, farmlands, burned moderately logged and edge areas with scattered trees or snags. Limited by the availability of snags with existing cavities. Historic viability: A Current viability: D	USDA 2019
Wilson's snipe (<i>Gallinago delicate</i>)	Suspected	Marsh/wet meadow group of the wetland family. Breeding habitat is sedge bogs, fens, and alder or willow wetlands occurring in ponderosa pine, Doug-fir, and grand-fir vegetation zones. Wetlands less than 7 acres have limited value as habitat. They forage in shallow water and mudflats. Historical viability: A Current viability: B	USDA 2019
Wood duck (<i>Aix sponsa</i>)	Suspected	Riparian/large tree or snag/open water groups. Nest primarily in late successional forests and riparian areas adjacent to low gradient rivers, lakes and wetlands. At least 10 ac of aquatic habitat should be available in a contiguous unit for successful nesting. Nest almost exclusively in tree cavities. Trees need to be >12 in d.b.h. to provide suitable cavities. Historic viability: A Current viability: C	USDA 2019

As described within the Colville National Forest Land Management Plan Final Programmatic Environmental Impact Statement Volume II, 2019 surrogate species represent habitats and risk factors associated to a group of wildlife species. The following table groups surrogate species in accordance with Table 178 found within the EIS (pg. 456) groupings which do not have surrogate species which do not need to be addressed were removed from the table. Under a no action alternative, habitats would continue to deviate from HRV standards which in the long term would have negative effects to species and habitat groups. Further deviation from HRV will cause viability of species to decrease further.

Table 2: Summary of Effects of the Proposed Action on Surrogate Species

Habitat Group	R6 Surrogate Species	Habitat Conditions	Risk Factors	Cumulative Effects	Effects Determination
All Forest Communities/ Medium-Large Trees	Cassin's Finch	Current habitat is below HRV standards, project activities are aimed to improving and moving the watershed closer to HRV standards. Refer to the silviculture report for more details about HRV. Refer to NOGO and GGO for additional details of potential effects.	<p>Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.</p> <p>Loss of large trees- There will be no increased risk due to forest plan guidelines direct retention of trees larger than 20 inches d.b.h. (<i>FW-GDL-Veg-03</i>)</p> <p>Loss of LSOF (late-successional and old forests)- Habitat is not within HRV standards. Treatment will focus on moving the habitat towards HRV standards, reducing effects of this risk factor thus improving habitat.</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance.</p> <p>Alteration of hydrologic regime- Through project activities there will be decommissioning of roads affecting hydrological conditions and other activities such as culvert replacement which will improve the watershed hydrologically and not increase this risk factor. Refer to aquatics report for more details.</p> <p>Fire exclusion- Project treatments are designed to respond to the increased risk of wildfire due to fire exclusion and there will be underburning treatment which will reduce the risk of catastrophic stand replacing wildfires to occur. Refer to fuels report for more details</p>	Cumulative effects can be described at a forest wide scale for this surrogate species /habitat group. These effects will have an impact to this surrogate group for approximately 10-20 years, dependent on the speed of regrowth. Activities considered include wildfires, vegetation management, and grazing. There will be a beneficial effect from this project due to the promotion of large tree growth and movement towards HRV standards, other ongoing and future vegetation management projects will have the same effects. Wildfires, if not high intensity, have provided a beneficial cumulative effect as they move stands towards HRV. Grazing will add a negative cumulative effect of reduction of forage. Overall the cumulative effects of this project, when combined with ongoing and future actions, are insignificant and discountable.	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but are not likely to lead to loss of species viability.
All Forest Communities/ Open Forest	Western Bluebird	Current habitat below HRV standards. The proposed project's intent is to move the abundance of stands within the middle structure closed stage towards open single story late structure	Loss of large trees and snags- There will be no increased risk due to forest plan guidelines direct retention of trees larger than 20 inches d.b.h. (<i>FW-GDL-Veg-03</i>). Plan standards also require retention of snags larger than 20 inches d.b.h. (<i>FW-STD-WL-12</i>), plan desired conditions also direct the appropriate sizes, amounts, and distributions of other snags according to vegetation types (<i>FW-DC-VEG-04</i>).	Cumulative effects can be described at a forest wide scale for this surrogate species /habitat group. These effects will have an impact to this surrogate group for approximately 10-20 years, dependent on the speed of regrowth. Activities	The action will move current vegetation standards closer to HRV benefitting this surrogate species and habitat group. Through project

Habitat Group	R6 Surrogate Species	Habitat Conditions	Risk Factors	Cumulative Effects	Effects Determination
		stages which will benefit this surrogate species and habitat grouping. Refer to the silviculture report for more details about HRV.	Fire exclusion- Project treatments are designed to respond to the increased risk of wildfire due to fire exclusion and there will be underburning treatment which will reduce the risk of catastrophic stand replacing wildfires to occur. Refer to fuels report for more details.	considered include; other vegetation management projects, wildfires, removal of hazard trees, and firewood cutting. Other vegetation management projects will help to move habitat towards HRV standards adding a beneficial cumulative effect. Wildfires which have occurred in the area also have provided positive effects as they have created openings. Removal of hazard trees and firewood cutting will add a negative cumulative effect through the potential removal of snags. Overall there will be a positive cumulative effect.	actions and forest plan standards and guidelines risk factors shall be reduced. Therefore, the proposed action may affect individuals but are not likely to lead to loss of species viability.
Grass/Shrub	Tiger Salamander	As this habitat type is limited and restricted to areas surrounding riparian areas there is no HRV standard for this habitat. As riparian areas are appropriately buffered from treatment it is unlikely for there to be effects from project activities on individuals or this habitat type.	<p>Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.</p> <p>Invasive Species- There is an increased risk of invasive plant species being spread through project activities but design elements will be put in place to help prevent the spread of invasives. Refer to invasive report for more detail.</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance due to presence of project layout, operations, and monitoring.</p>	Even though there are potential increases to risk factors for this habitat group there are no anticipated effects to Tiger Salamanders or the Grass/Shrub habitat type through the proposed project. Therefore there will be no cumulative effects.	The proposed action will have no effect on this habitat type or individuals.
Medium-Large Trees/ Cool-Moist Forest	American Marten, Pileated Woodpecker	Current habitat is below HRV standards for late closed spruce/subalpine fir habitat and above HRV standards for other cool-moist veg types and structure	Road density- Project activities will temporarily increase road density through the project area due to the temporary roads needed to provide access to units. In the long term road density will decrease within the project area as temporary roads will be closed after use and restored to hydrologically stable conditions, and additional previously open roads will be decommissioned. Refer to the	Cumulative effects can be described at a forest wide scale for this surrogate species/habitat group. There will be a slight positive effect from this project on foraging habitat within the next 5 years and a slight	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability.

Habitat Group	R6 Surrogate Species	Habitat Conditions	Risk Factors	Cumulative Effects	Effects Determination
		stages within the project area. Treatment will be focused on reducing densities in this vegetation type. Refer to the silviculture report for more details about HRV.	<p>Environmental Analysis report for more detail.</p> <p>Created openings- Through the reduction of density in this habitat type there will be an increase in created openings but not to a level which would have a negative effect. In fact the opening of these vegetation stands will have an overall positive effect, enhancing the growth of larger trees.</p> <p>Loss of large trees and snags- There will be no increased risk due to forest plan guidelines direct retention of trees larger than 20 inches d.b.h. (<i>FW-GDL-Veg-03</i>). Plan standards also require retention of snags larger than 20 inches d.b.h. (<i>FW-STD-WL-12</i>), plan desired conditions also direct the appropriate sizes, amounts, and distributions of other snags according to vegetation types (<i>FW-DC-VEG-04</i>).</p>	negative effect on nesting habitat for species in this group which will occur over the next 10-15 years. Overall there will be a slight improvement for habitat due to the opening of stands. This effect should persist for the next 10-15 years. Other vegetation management projects occurring on the CNF will have similar cumulative effects to old growth associated species and will have effects for 10-20 years.	The proposed action may affect individuals but are not likely to lead to loss of species viability.
Open Forest/Early Successional	Fox Sparrow	Current habitat is within appropriate HRV standards for all forest types except within subalpine fir/lodgepole pine where the current amount of habitat is below desired conditions. Project activities will target middle stage structure types which are above HRV standards and aim to move those stands towards more appropriate structure stages according to HRV.	Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.	Cumulative effects can be described at a forest wide scale for this surrogate species/habitat group. Activities considered for cumulative effects include other vegetation management projects and grazing. This project and other vegetation management projects will have a similar effects in that early successional stages will be promoted through treatment. This cumulative effect will occur for approximately 5-10 years. Grazing will have a negative cumulative effect through the reduction of forbs within this habitat type. The reduction of forbs through grazing will occur indefinitely as long as	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but are not likely to lead to loss of species viability.

Habitat Group	R6 Surrogate Species	Habitat Conditions	Risk Factors	Cumulative Effects	Effects Determination
				grazing is permitted in these habitat areas. Overall there will be a beneficial cumulative effect on this habitat type.	
Open Forest /Woodland/ Grass/Shrub/ Cave	Fringed Myotis, Pallid Bat	The amount of late open habitat which is ideal for bats is currently below HRV standards. The proposed project will treat mid open structure which is above HRV in order to promote growth of larger trees. For further discussion refer to the silviculture report and for additional effects discussion on bat species refer to the BE.	<p>Loss of large trees and snags- There will be no increased risk due to forest plan guidelines direct retention of trees larger than 20 inches d.b.h. (<i>FW-GDL-Veg-03</i>). Plan standards also require retention of snags larger than 20 inches d.b.h. (<i>FW-STD-WL-12</i>), plan desired conditions also direct the appropriate sizes, amounts, and distributions of other snags according to vegetation types (<i>FW-DC-VEG-04</i>).</p> <p>Loss of riparian habitat- Riparian habitat will be appropriately protected and treated to standards described in the forest plan and other aquatic standards, therefore no increase in risk. Refer to aquatics report for details.</p> <p>Loss of roost sites- Forest plan standards and guidelines prevent large trees and snags from being removed for harvest and treatments near riparian areas will promote growth of deciduous trees which may be roosts. Therefore, project activities will not increase chance of this risk factor.</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance.</p> <p>Insecticides- No use of insecticides will occur through project activities, no increase in this risk factor.</p>	A characterization of cumulative effects to this species can reasonably be made at the project area scale. Activities occurring within the cumulative effects area considered include: hazard tree removals, and firewood cutting. These activities will reduce the number of snags throughout the project area, potentially reducing the roosting sites for bats. These effects would be cumulative to those resulting from the proposed action and are likely to have an effect for 10-20 years.	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but are not likely to lead to loss of species viability.
Open Water/Snag Habitat	Wood Duck	Open water habitat will not be affected by project activities, there are no HRV standards for open water habitat. Large snags are below HRV standards. There will be no reduction of large snags through project activities and there will be a positive	<p>Loss of snags- There will be no increased risk due to forest plan standards requiring retention of snags larger than 20 inches d.b.h. (<i>FW-STD-WL-12</i>), plan desired conditions also direct the appropriate sizes, amounts, and distributions of other snags according to vegetation types (<i>FW-DC-VEG-04</i>).</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance during layout, implementation, and project monitoring.</p>	Cumulative effects can be described at a forest wide scale. Activities which will contribute to cumulative effects include; other vegetation management projects, hazard tree removal, and firewood cutting. These activities may result in a reduction of snags along roadways and if	The action will not affect habitat or increase risk factors at a significant level which would affect species or habitat viability. The proposed action may affect individuals but

Habitat Group	R6 Surrogate Species	Habitat Conditions	Risk Factors	Cumulative Effects	Effects Determination
		effect on this habitat type through treatment goals of promoting growth of large trees.		nearby open water will have a negative effect on wood ducks and this habitat type. Other vegetation projects will have similar effects as this proposed project adding a beneficial cumulative effect. These cumulative effects are expected to effect this habitat type for 10-20 years.	are not likely to lead to loss of species viability.
Riparian/ Pond/Small Lake/ Backwater/ Wetland / Open Water/Wet Meadow	Wilson's Snipe, Columbia Spotted Frog	Riparian areas as listed will be treated according to forest plan and other aquatic standards. There are no HRV standards for this habitat type. It is unlikely for there to be effects from project activities on individuals or this habitat type.	<p>Invasive Species- There is an increased risk of invasive plant species being spread through project activities. Refer to invasive report for more detail.</p> <p>Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.</p> <p>Road density- Project activities will temporarily increase road density through the project area due to the temporary roads needed to provide access to units. In the long term road density will decrease within the project area as temporary roads will be closed after use and restored to hydrologically stable conditions, and additional previously open roads will be decommissioned. Refer to transportation report for more detail.</p> <p>Human disturbance- While project activities are occurring there will be a temporary increase in human disturbance.</p> <p>Fire exclusion- Project treatments are designed to respond to the increased risk of wildfire due to fire exclusion and there will be underburning treatment which will reduce the risk of catastrophic stand replacing wildfires to occur. Refer to fuels report for more details</p>	As there are no anticipated effects from project activities on this habitat type or individuals there will be no cumulative effects.	The proposed action will have no effect on this habitat type or individuals.

Habitat Group	R6 Surrogate Species	Habitat Conditions	Risk Factors	Cumulative Effects	Effects Determination
Riparian/ Shrubby Deciduous	MacGillivray's Warbler	Riparian areas as listed will be treated according to forest plan and other aquatic standards. There are no HRV standards for this habitat type. It is unlikely for there to be effects from project activities on individuals or this habitat type.	Grazing- No change in this risk factor through project activities, grazing occurs within the project area and is an ongoing risk factor.	As there are no anticipated effects from project activities on this habitat type or individuals there will be no cumulative effects.	The proposed action will have no effect on this habitat type or individuals.

Management Indicator/Focal Species

Management indicator/Focal species were selected to monitor the potential effects of major forest management activities. These major activities include: grazing, forest vegetation restoration (such as thinning and prescribed fire), and post-fire salvage harvest. The species below were selected to represent the effects of these management activities. All four of these species have been discussed either in the biological evaluation for the project or earlier in this report. No further analysis/discussion is needed.

Table 3: MIS/Focal Species for the CNF

Species	Management Activity
MacGillivray's warbler	Grazing, understory effects
Black-backed woodpecker	Post-fire salvage harvest
Northern goshawk	Forest vegetation management
White-headed woodpecker	Forest vegetation management

Management Interest Species (Elk and Deer spp.)

Habitat Conditions/Habitat Effectiveness

Existing habitat conditions and design criteria to achieve Forest Plan desired conditions, guidelines, and specific design measures to address big game are discussed within the Biological Evaluation. Summer and winter range cover and forage conditions and project effects are discussed within the Grey Wolf and Grizzly Bear sections of the report.

Human Activities/Zone of Influence

Species of management interest include big-game species that are of high interest to the public. Several desired condition statements (*FW-DC-WL-13* and *FW-DC-WL-14*) within USDA, 2019 refer to 'habitat effectiveness' or 'zone of influence.'

Existing Conditions

Big game animals tend to under-utilize areas within 0.25 mile of open roads and motorized trails, compared to areas further removed from these features. Within road corridors animals are prone to; disturbance from vehicle traffic, vehicle collisions, mortality from legal harvest, and poaching. The following table displays the existing levels of open road influence zones on big game winter and summer ranges in the project area, relative to Forest Plan desired conditions. Methods to address habitat effectiveness and zone of influence can be found in Gaines et al. (2003). For winter and summer range the level of human influence is low if < 30% of the range is within the .25 mile influence zone, moderate if 50-30% is within the zone, and high level of influence if > 50% of the range is within the zone of influence.

Table 4: Existing acres influenced by open motorized routes on big game range

Big Game Habitat Component	Forest Plan Desired Condition	Total Habitat Acreage	Approximate Acres Within Influence Zone	Percent of Range Within Zone	Current Level of Human Influence
Winter range area within 0.25 mile of open roads / motorized trails	<30% of the winter range within zone	19,800	10,253	52%	High
Summer range area within 0.25 mile of open roads / motorized trails	<50% of the summer range within zone	28,682	23,125	81%	High

Direct and Indirect Effects

The level of human disturbance in the project area would increase for the duration of the project (estimated 5 years). Nearly all the existing closed roads in the project area could be opened during harvest activities, though not all would be open at the same time. Additionally, approximately 3.65 miles of temporary road segments would be constructed to access timber stands for management. While project activities are occurring on re-opened or temporary roads, the zone of human influence would increase in the project area.

Post project, all roads opened for the project would be reclosed or obliterated so the zone of influence will return to its pre-project level. Post-project, about 14.65 miles of road, including temporary road would be closed. 2.6 miles of road will be decommissioned all of which are currently closed and approximately 1 mile of currently open road will become closed to public vehicular use, slightly reducing the level of human influence but not at a significant level.

Cumulative Effects

Cumulative effects can be examined at a forest wide scale and will be analyzed over the next 5-10 years. Cumulative effects will result due to overlap of other FS vegetation restoration projects across the forest. These cumulative effects will be the same effects as described under direct and indirect for human activities/zones of influences for this project. Cumulative effects include improvement of foraging habitat due to harvest activities promoting understory growth, temporary displacement of individuals due to increase in human activity, and potentially reduction of the zone of influence through road closures after the project is completed. Additionally, past wildfires in the project area have reduced hiding cover availability, as could potential future wildfires. However, this initial decrease in hiding cover would improve forage habitat within 5-10 years.

Effects Determination

The proposed project will have temporary negative effects on big game species due to an increase in human activity within the project area. In the long term project activities will improve forage habitat conditions and maintain appropriate levels of hiding cover, moving habitat towards the HRV. All Plan guidelines will be incorporated into project design. Therefore, the project as proposed will not contribute to a negative trend in viability of big game populations on the CNF.

Landbirds

Birds of Conservation Concern - Bird Conservation Regions (BCRs) are ecologically distinct regions in North America with similar bird communities, habitats, and resource management issues. This project falls into the Northern Rockies BCR (BCR 10). Table 5 lists those bird species that can be found in northeast Washington. Effects of vegetation management on those species that could occur in the project area will be addressed. Other migratory bird species that use the habitats present in the project area are relatively common across the Forest and well distributed over much of northeast Washington.

Table 5: Migratory birds of conservation concern in the Northern Rocky Mountains Bird Conservation Region (USFWS, 2008). Species in shaded blocks are addressed in this report. This table does not include species which are previously covered as federally listed, sensitive, or surrogate species

Bird species	Status in Project Area	Preferred habitats
Black swift (<i>Cypseloides niger</i>)	Habitat not present	Nests on ledges or shallow caves in steep rock faces and canyons, usually near or behind waterfalls and sea caves. Forages over forests and open areas in montane habitats.
Brewer's sparrow (<i>Spizella breweri</i>)	Habitat not present	Rare summer breeder in NE WA. A sagebrush obligate found in shrublands of contiguous big sagebrush, greasewood, rabbitbrush, and shadscale habitats.

Bird species	Status in Project Area	Preferred habitats
Calliope hummingbird (<i>Stellula calliope</i>)	Suspected	Open shrub/sapling seral stages (8-15 years), meadows, burned areas, and riparian thickets at higher elevations.
Flammulated owl (<i>Otus flammeolus</i>)	Suspected	Associated with ponderosa pine forests and mixed conifer stands with a mean 67% canopy closure, open understory with dense patches of saplings or shrubs. Grassy openings for foraging.
Gray crowned rosy-finch (<i>Leucosticte tephrocotis</i>)	Habitat not present	Only occurs in NE WA in winter. Found above timberline among bare rock outcroppings, cirques, cliffs, and hanging snowfields.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Habitat not present	Extremely rare to occur or nest in NE WA. Typically occurs in upland grassland areas but can be found in forests with large openings.
Olive-sided flycatcher (<i>Contopus cooperi</i>)	Suspected	Open conifer forests (< 40 % canopy cover) and edge habitats where standing snags and scattered tall trees remain after a disturbance.
Williamson's sapsucker (<i>Sphyrapicus thyroideus</i>)	Suspected	Mid to high elevation, mature open and mixed coniferous / deciduous forests. Snags are a critical component.
Willow flycatcher (<i>Empidonax trailii</i>)	Suspected	Associated with riparian shrub dominated habitats, especially brushy / willow thickets.

Migratory birds utilize a variety of habitats, including upland coniferous forests (in all stages of development), openings, and riparian zones. Of greatest concern from a management perspective are those habitats that, when compared to the rest of the Forest, contain unique characteristics, are naturally limited in abundance or distribution, or have experienced the greatest declines or changes over time. In general, bird species requiring these habitats have undergone greater population declines over time than other species that primarily use general coniferous forest habitats. Within the project area, these areas of concern would include wetlands, riparian areas, large snags and areas with deciduous trees. Within coniferous forest habitats, areas classified as old forest, single story are also important because this condition is more limited than other coniferous forest habitats. Like many watersheds on the CNF the project area is below the historical range of old forest, single story though is within the historical ranges for old structure multi-story. In the project area, a few wetland areas occur. Small stands of aspen or cottonwood are located along more moist habitats and stringers throughout the project area. Many of these stands are senescent due to ingrowth of conifers.

Direct and Indirect Effects

Activities affect each species differently and at different levels (individual, population, community and landscape), the response being driven by the interaction of each activity's timing, intensity and extent with each individual's mobility and escape strategies and a species' population size and habitat requirements. Thus, management activities create, enhance or destroy habitat, depending on the species considered.

The proposed activities affect a small amount of habitat relative to the overall ranges of the birds that use the environments that occur in the area, and none would significantly impact riparian areas. Nearly all the proposed commercial harvest would move conditions in the project area from the more closed, middle structural stands to a more diverse condition with openings and blocks of retained, untreated patches similar to what was present on the landscape historically. Several units, particularly on drier sites, are designed to open stands and move these middle-structure, multi-story stands to single-stratum stands. The underburning associated with commercial harvest would enhance the movement of these stands towards single-stratum stands, and the areas proposed for underburning only would yield stand conditions more in line with historic ranges of variability in stand structure and would enhance habitat for species that depend on open stands of large trees. Thereby benefiting the species which may be present in the project area. There may be short term loss of habitat and individuals will be disturbed but suitable and sufficient habitat will remain on the landscape so that these species would not exhibit a population decline. None of these species are considered threatened by habitat loss and none are on any lists of species of concern.

Cumulative Effects

The cumulative effects area for migratory birds is northeast Washington. Cumulative effects are analyzed from 5-20 years. For all land surrounding the project area, migratory land bird habitat conditions have been affected by a wide variety of management and activities and natural processes, such as timber harvest, grazing and fire suppression has reduced much of the habitat diversity that occurred across the project area when fires actively burned, especially on the lower elevations of the project area.

The cumulative effects of the above activities have been proportionally greater in those habitats that historically have been transitory in nature and/or in limited supply such as openings, shrub fields, riparian habitat, early successional forests, and single stratum forest types than in the general coniferous forest environment. Current and future management activities on NFS lands that maintain or improve these types of habitats contribute cumulatively to the perpetuation of bird species that require these conditions and the maintenance of the area's bird species diversity.

Effects Determination

Based on this discussion, the project would meet the intent of the Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington (Altman & Bresson, 2017) and all other management direction related to landbirds. Thus, we expect the project would not influence the continued viability of Landbird species across the forest.

Snags and Coarse Woody Debris (CWD)

Snags and CWD or dead wood habitat provides essential habitat components for many primary and secondary cavity-nesting species of birds such as black-backed and pileated woodpeckers, mammals such as American marten and many bat species, amphibians, and invertebrates.

Existing Conditions

Snag Habitat Requirements - The following table displays the average diameter of snags used by primary cavity excavators and other species by forest habitat type. Data is provided for three population tolerance levels for each species. For example, snags that are 36.4 inches in diameter at breast height (DBH) would provide for 80 percent of the pileated woodpecker population in mixed conifer habitats east of the cascades (based on research conducted in those habitat types). Snags that are 29.8 inches DBH would provide for only 50 percent of the population. In other words, larger snags can accommodate a greater percentage of the nesting pileated woodpecker population.

Table 6: Diameters of snags required for nesting / denning by species by forest type. (Adapted from DecAID tables EMC_M.sp-1, MMC_M.sp-1, LP_M.sp-1, and PPDF_M.sp-1)

Species (status)	Eastside mixed conifer Tolerance level for snag diameter (inches)			Montane mixed conifer Tolerance level for snag diameter (inches)			Ponderosa Pine/Douglas- Fir Tolerance level for snag diameter (inches)		
	30%	50%	80%	30%	50%	80%	30%	50%	80%
American marten (surrogate)	21.0	32.5	47.0	27.5	35.2	54.3	21.0	31.9	47.0
Black-backed woodpecker (surrogate)	8.8	12.1	16.9	No data	No data	No data	8.2	13.3	20.7
Flammulated owl (landbird of concern)	20.7	24.8	30.8	No data	No data	No data	22.2	26.0	31.7
Pileated woodpecker (surrogate)	25.4	29.8	36.4	No data	No data	No data	25.8	30.3	37.2
White-headed woodpecker (sensitive)	21.0	27.0	36.3	No data	No data	No data	20.0	25.7	34.7
Williamson's sapsucker	19.7	24.6	32.2	No data	No data	No data	19.5	24.4	32.0

(landbird of concern)									
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The following table contains data synthesized in DecAID from various studies relating snag density to wildlife use. DecAID provides snag density tolerance levels for the species which are of concern/note on the CNF. Data was compiled from the Small, Medium, and Larger Trees Structural Condition Classes tables for the Eastside Mixed Conifer, Montane Mixed Conifer, Lodgepole Pine and Ponderosa Pine/Douglas-Fir wildlife habitat types.

Table 7. Snag densities required by various species at nest, roost, or den sites for two different snag size classes. (Adapted from DecAID tables PPDF_M sp-4, EMC_M sp-4, and MMC_M sp-4)

Species (status)	Small snags (10-19.9 inch) Tolerance level for snag density (snags per acre)			Large snags (20+ inch) Tolerance level for snag density (snags per acre)		
	30%	50%	80%	30%	50%	80%
American marten (surrogate)	0	13.0	74.8	0	4.0	22.9
Black-backed woodpecker (surrogate)	2.5	13.8	29.5	0	1.5	5.8
Flammulated owl (landbird of concern)	No data	No data	No data	No data	No data	No data
Pileated woodpecker (surrogate)	16.3	30.7	51.1	3.6	8.0	18.6
White-headed wood. (sensitive)	0.2	6.6	19.0	0.3	1.5	3.5
Williamson's sapsucker (landbird of concern)	14.2	28.7	50.3	3.1	8.5	16.5

The preceding table indicates that the larger the average snag diameter is in an area, the fewer snags per acre are required to sustain a given MIS population level. It is important to note that most of the data in the above table were recorded at nest, roost, or den sites. “Snag densities at these sites were often higher than snag densities in random plots in the surrounding stand. This difference might indicate that wildlife use or perhaps select for clumps of snags. Extrapolating the snag densities from such sample plots to a per-hectare basis may yield very high snag densities that may not be appropriately interpreted as stand-wide averages or management objectives” (Mellen-McLean et al. 2017).

Existing Snag Levels – Snags in the project area reflect the disturbance history, and more snags on average appear available in the project area than in most large project areas analyzed in the recent past. Most of the old forest, multi-stage stands are within their historic ranges of variability and have not been harvested in the past, so large tree snag levels for these stands are high.

Timber harvest on private, state, and other non-NFS ownerships must manage snags according to the Washington State Forest Practices Rules for wildlife tree retention. In eastern Washington, 2 snags (if they exist) and 2 green snag recruitment trees must be left on each harvested acre. Precise snag quantities within the project area are subject to fluctuation and not known.

Down Log Requirements - Down logs provide resting and foraging sites for woodpeckers. DecAID contains information on the down log requirements of American marten, woodpeckers as a group, and ants upon which several of the species forage. The following tables are the results of synthesized data for wildlife use of down wood sizes (diameter) for denning, resting, ant colonies, foraging and occupied sites from studies for the various habitat types.

Table 8: Down log sizes required for nesting/resting/foraging by species by forest type (down wood considered is greater than 5 inches) (synthesized from DecAID tables EMC_ECB_M.sp-6 and PPDF_M.sp-6)

Species	Eastside mixed	Montane mixed	Lodgepole pine	Ponderosa
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	conifer tolerance level for down log diameter (inches)			conifer tolerance level for down log diameter (inches)			tolerance level for down log diameter (inches)			Pine/Douglas-Fir Tolerance Level for down log diameter (inches)		
	30%	50%	80%	30%	50%	80%	30%	50%	80%	30%	50%	80%
American marten	20.6	26.0	33.5	No data	No data	No data	No data	No data	No data	No data	No data	No data
Woodpeckers	5.3	11.3	20.6	No data	No data	No data	No data	No data	No data	7.7	10.3	14.3
Large ant species	4.9	10.4	18.9	No data	No data	No data	No data	No data	No data	7.0	9.7	13.8
Small ant species	5.3	10.4	18.4	No data	No data	No data	No data	No data	No data	7.6	10.2	14.2

Table 9: Down log densities required by species by forest type (down wood considered is greater than 5 inches
(synthesized from DecAID tables EMC_M.sp-7 and LP_M.sp-7)

Species	Eastside mixed conifer tolerance level for percent of down wood cover			Montane mixed conifer Tolerance level for percent of down wood cover			Lodgepole pine tolerance level for percent of down wood cover			Ponderosa Pine/Douglas-Fir tolerance level for percent of down wood cover		
	30%	50%	80%	30%	50%	80%	30%	50%	80%	30%	50%	80%
American marten	No data	No data	No data	No data	No data	No data	11.3%	24.7%	44.6%	No data	No data	No data
Black-backed woodpecker	4.7%	13%	25.1%	No data	No data	No data	4.7%	13%	25.1%	No data	No data	No data
Pileated woodpecker	3.9%	4.2%	4.6%	No data	No data	No data	No data	No data	No data	No data	No data	No data

Existing Down Log Levels – Just as with snags the amount of down logs in the project area reflect the disturbance history, and more are available in the project area than in most large project areas analyzed in the recent past.

Direct and Indirect Effects

Effects of Timber Harvest on Snags – The majority of the proposed commercial treatments consist of thinning, which should accelerate the development of large trees in the project area and which should, over the long term, lead to large diameter snags and down logs. Timber harvest and fuel reduction activities would reduce ladder fuels and tree crown biomass, reducing the potential for hot, crown fires to occur in the project area. The proposed action would move the landscape closer to its historic fire regime, therefore closer to appropriate HRV standards.

Effects of Timber Harvest on Down Logs - All logs that are in later stages of decay would be left on site, since they have no commercial value. Following harvest, some retained over-story trees might break or uproot in stands that have been made considerably more open because wind patterns above and through the stands change. Broken-topped and wind-thrown trees would contribute to snag and down log levels providing woodpecker habitat.

Effects of Non-commercial Fuels Treatments - Mechanical fuels treatments would impact non-commercial sized trees only. These treatments would have insignificant or discountable effects to dead wood habitats. Mortality of the over-story in stands treated with prescribed fire is expected to be about 1 tree per acre because the intent of these fires is to reduce fuel and rejuvenate shrubs and forbs rather than create stand-replacing conditions. Thus, there would be a small pulse of snags created in burned areas. After a few decades most of these trees would have fallen to the ground and would provide additional down log

material. Trees injured but not killed by these fires could develop heart rot or other defects that could provide opportunities for cavity excavation.

Cumulative Effects

The cumulative effects analysis area for primary cavity excavators is the Colville National Forest. Effects are analyzed 5-20 years. Relevant past, present, and reasonably foreseeable future actions were considered including other vegetation management projects, hazard tree removal, firewood cutting, and wildfires. This project should accelerate the development of large trees in the project area and should lead to large diameter snags and down logs. Through project actions overall the extent of hardwoods could increase in the project area, eventually providing high quality cavity excavator habitat as these trees mature. These and other effects of this project are similar and cumulative to effects of other vegetation management projects occurring on the Forest. Hazard tree removal and firewood cutting will reduce the number of future available natural snags on the landscape, having a negative cumulative effect. Wildfires which have occurred on the forest have provided a large amount of snags and down wood which contributes to the cumulative effects as a beneficial impact.

Effects Determination

Based on the predicted project effects and given the design elements, the proposed project should not contribute to a negative trend in viability for dead wood habitat.

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